



Centre for Air Power Studies (CAPS)

Forum for National Security Studies (FNSS)

MAKE IN INDIA: A NEW HOPE FOR INDIA'S AVIATION INDUSTRY

Gp. Capt. Vivek Kapur, Senior Fellow, CAPS

Introduction

Aviation in India in the modern era commenced within a decade of the first flight by the Wright brothers' Flyer-1 at Kitty Hawk in Dec 1903. This flight is widely accepted as first flight of a heavier than air machine which ushered in the era of modern aviation. The first commercial flight in India was made on 18 February 1911, when a French pilot, Monsignor Piguot, flew airmails from Allahabad to Naini, covering a distance of about 10 km in as many minutes. The first flight by an Indian on a commercial aviation task was fulfilled with the formation of the Tata Aviation Service in 1932. The first flight of Indian Civil Aviation took off from Drigh Road airfield in Karachi on October 15, 1932, with Mr JRD Tata at the controls of a Puss Moth biplane that he flew solo to Bombay, via Ahmedabad. Tata Aviation Service later became Tata Airlines and then Air-India and later even spread its wings abroad as Air-India International. The Indian Air Force (IAF) was authorised to be formed as an independent military force on 08 Oct 1932. Despite this early advent of modern aviation into the country India still remains heavily import dependent for its aviation needs. This situation prevails in both the civil and military sectors of the industry. There appears to be a push towards remedying this situation through the "make in India" initiative undertaken by the current Government.

Background

With growth of the Indian nationalist movement demands for Indianisation of the armed forces gained ground. A committee was formed in 1925 under chairmanship of the Chief of General Staff, Lt Gen Sir Andrew Skeene, KCB, KCIE, CMG, to study the proposal regarding the Air Force. This



Centre for Air Power Studies (CAPS)

Forum for National Security Studies (FNSS)

committee recommended that selected, deserving Indians should be given King's Commission to form an air arm of the Indian Army and be sent to the Royal Air Force training college at Cranwell. The Indian Air Force Act became effective from 8 October 1932. India's first civil air operator, TATA Aviation Services was also formed and commenced operations in 1932. Later TATA Aviation became Air India, which post nationalisation operates even today, alongside half a dozen other scheduled air services companies.

On 01 Apr 1933 'A' Flight of No.1 Squadron of the IAF was formed at Karachi with four Westland Wapiti aircraft. In due course more flights were added to complete the squadron. Progressively more squadrons were raised. This expansion of the IAF gained momentum during World War-II due to operational necessity. Today the IAF comprises close to 750 front line fighters and approximately a similar number of transport and other support aircraft in addition to helicopters making it the fourth largest air force in the world.ⁱ Indian civil aviation has also expanded from merely Air India to include more than half a dozen scheduled airlines and several dozen air charter operators. Despite this large number of aircraft in service in the country there is no viable source of civil or military aircraft in the country. This forces a major outflow of foreign exchange to equip and then to periodically upgrade / replace the aircraft in operation in India.

Having been a British colony, India initially met its aviation equipment needs through import of British aircraft. This saw India operate the Westland Wapiti-IIA, Lysander, Hurricane, Spitfire, Percival Prentice, Vampire, Gnat, HS-748 Avro", and Canberra to name a few. In later years India diversified its aviation purchases to include France before entering an era of reliance on the erstwhile Soviet Union for military equipment and on the US and Europe for civil aircraft. Since the demise of the Soviet Union in 1991 India's military aircraft purchases have, while still relying to a large extent on Russia, the Soviet Union's successor state, also included enhanced sourcing from Western Europe and the US. Civil aircraft continue to be imported from Boeing of the US and Europe's Airbus in addition to Bombardier of Canada and Embraer of Brazil. A single modern current generation fighter costs as much as \$ 50 to \$100 millionⁱⁱ while modern military cargo aircraft cost approximately \$200 million each.ⁱⁱⁱ Modern civil airliners such as the Airbus A-320 cost



Centre for Air Power Studies (CAPS)

Forum for National Security Studies (FNSS)

about \$100 million each.^{iv} These prices bring out the magnitude of foreign exchange outflow from the country during initial purchase and replacement of these aircraft. Provisioning for spare parts and maintenance increases this cost even further.

India's first aircraft factory, Hindustan aircraft Limited (HAL) was set up in the private sector during Dec 1940 at Bangalore. This factory intended to undertake design and development of its own aircraft in addition to initial license manufacture of foreign designs. However, within two years of its formation HAL was nationalised and remains so till today. HAL has been engaged in manufacture of foreign designs for the majority of its existence. It has designed and manufactured a few aircraft including the HT-2, HJT-16 and HPT-32 basic trainers, Dhruv Advanced Light helicopter (ALH), and the HF-24 jet fighter. Of these the HT-2 and HJT-16 were successful programs while the HPT-32 suffered from recurrent engine failure in flight issues and the HF-24 failed to meet its desired performance parameters due to lack of a suitable engine. Despite the problems the HPT-32 served in IAF for close to 30 years while HF-24s equipped three IAF fighter squadrons for close to a decade. ALH continues to be inducted into service in ever larger numbers. The Tejas Light Combat Aircraft (LCA) initial model, after a series of cost and time overruns, is close to being inducted into IAF. The Tejas Mk-II with more powerful engines is expected to be inducted about a decade later.

Analysis of Earlier Methodology

Several attempts have been made to develop a more efficient domestic aircraft industry. These attempts have primarily focussed upon measures to try and make HAL function more effectively while leaving HAL's monopolistic hold on the domestic aircraft industry untouched. Given the earlier industrial policies that made aircraft manufacture a state monopoly these attempts did not yield results. In the instances where domestic programs successfully led to development of aircraft for use by the IAF, such as the HJT-16 "Kiran" and HF-24 "Marut", these became one off projects. That is to say that after the given project was completed to the extent that was possible, there was no attempt to carry out a follow on project that could build upon the learning and expertise gained



Centre for Air Power Studies (CAPS)

Forum for National Security Studies (FNSS)

for the future. Thus the personnel who had gained valuable skills and experience with the HJT-16 and HF-24 projects were allowed to disperse. Such a situation led to a “starting from scratch” scenario when a later project was attempted, as with the LCA Tejas; the next fighter project after the HF-24.

Current Situation and Prospects

While the LCA program has not yet been completed successfully, it is noteworthy that several areas of domestic expertise have been built up in various aspects of aircraft technology ranging from composite materials, advanced digital quadruplex fly by wire control systems, cockpit displays etc. the LCA design has been done domestically by an all Indian design team thus also building up expertise and experience in this area.

With the known procurement policies of induction of Su-30MKI fighters alongside France’s Rafale and later on induction of a variant of the Russian Perspective Aviatsya Komplex Frontovoyi Aviatsya (PAK FA), which translates roughly as “Prospective Aviation Complex [for] Tactical Aviation” as the Fifth Generation Fighter Aircraft (FGFA) it appeared certain that the expertise built up during the LCA program would again be allowed to decay as had happened in the past in the aftermath of the HF-24 program.

It was reported in the major English daily newspaper, the “Times of India” on 08 Jan 2015 that the Government is close to a decision to design and, manufacture the FGFA domestically through going ahead with India’s Defence Research and Development Organisation’s (DRDO’s) advanced Medium Combat Aircraft (AMCA) proposal.^v The article in the “Times of India” goes on to imply that while negotiations are in progress with Russia to resolve all outstanding issues with co-development of the PAK FA and its spinoff FGFA, India appears to be keen to pursue a parallel AMCA project domestically. If this news report is grounded in actual events on the ground it is very good news for India’s future prospects to field an effective domestic aircraft industry.



Centre for Air Power Studies (CAPS)

Forum for National Security Studies (FNSS)

There is a wealth of material on the internet that implies that DRDO and HAL have already initiated initial design, of the AMCA airframe. This indicates that there is some seriousness in the DRDO towards this project. The AMCA project if it is initiated would enable channelling of the expertise and experience built up with the LCA project into a new and challenging task. At the same time the opening up of this industry to participation by private sector companies bodes well for introduction of greater efficiency and direction in the Indian aircraft industry. If the project is initiated with realistic timeframes and performance specifications it would help consolidation of the skills of India's aircraft design and development fraternity. At the same time as the news report in the "Times of India" says that all attempts are on to close the PAK FA / FGFA contract with Russia also, the PAK FA based FGFA should be able to form a back up to the AMCA so that any unforeseen delays in readiness of the AMCA do not adversely affect the IAF's operational capabilities.

Reported developments in the past few weeks make the emerging situation in India's aircraft design and manufacturing sector very interesting with optimistic projections for future success on a greater scale than has been achieved till date.

Conclusion

India entered the era of modern aviation within a few years of the flight of Flyer-I at Kitty Hawk in Dec 1903. Thereafter despite the rapid growth of both civil and military aviation in the country and the setting up of HAL in Dec 1940, India has been unable to meet its aircraft and equipment needs domestically. This lack has led to a major outflow of foreign exchange on importing required equipment from foreign sources. The few attempts to design and manufacture aircraft in India since 1947 were allowed to peter off through lack of any follow on projects. Recent news reports indicate that a fresh initiative to make aircraft in India is in the offing. The timing of this reported attempt comes at a good time as it would allow feeding the learning from the LCA project into the proposed AMCA project. Such a flow could increase the chances of success for the Indian aircraft industry.



Centre for Air Power Studies (CAPS)

Forum for National Security Studies (FNSS)

(Disclaimer: The views and opinions expressed in this article are those of the author and do not necessarily reflect the position of the Centre for Air Power Studies [CAPS])

-----XXXXXXXX-----

ⁱ "Our Strength Indian Air Force Today", <http://www.indianairforce.nic.in/>, accessed on 12 Jan 2015.

ⁱⁱ Edward Hunt, "Analysis: Expectations for deployment of fifth-generation fighters", <http://www.janes.com/article/43616/analysis-expectations-for-deployment-of-fifth-generation-fighters>, accessed on 12 Jan 2015.

ⁱⁱⁱ "C-17 Globemaster-III Specifications", http://www.globalaircraft.org/planes/c-17_globemaster_iii.pl, accessed on 12 Jan 2015.

^{iv} "Airbus Aircraft 2014 Average List Prices (mil USD)", <http://www.airbus.com>, accessed on 12 Jan 2015.

^v Rajat Pandit, "Make-in-India: Plan to develop 5th-generation fighter aircraft", <http://timesofindia.indiatimes.com/india/Make-in-India-Plan-to-develop-5th-generation-fighter-aircraft/articleshow/45802270.cms>, accessed on 08 Jan 2015.